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Effects of Repeated Exposure to Negative Stimuli on Associative Memory

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Introduction

- The ability to remember associations (e.g., a person's face with his/her name) is an important aspect of healthy memory function.
- Emotional arousal (particularly negative emotion such as fear and anger) is known to disrupt associative memory more than other types of memory^{1,2,3}.
- It is unclear how these adverse effects on associative memory can be reduced.

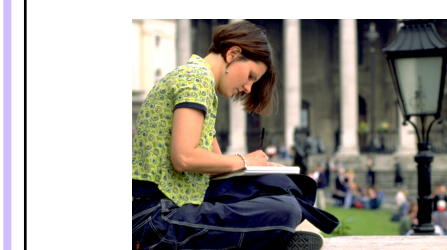
Research Question:

Would repeated exposure to negative images reduce their negative effects on associative memory (desensitization) ?

Method (n = 112)

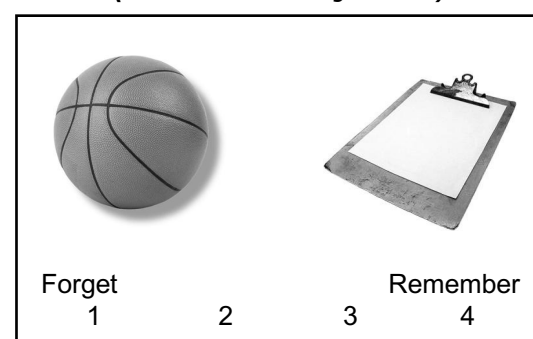
Study

Distractor image
(negative or neutral)



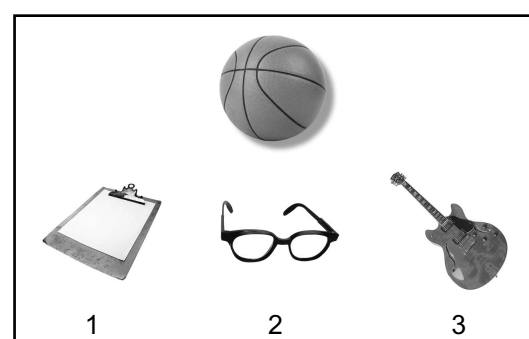
1s

Study pair
(neutral objects)



3s

Memory Test



self-paced

x4 runs

Groups (negative and neutral):

- Evoked negative emotion (negative condition) or did not evoke emotion (neutral condition) through distractor images in the study phase
- 56 participants in each group

Study:

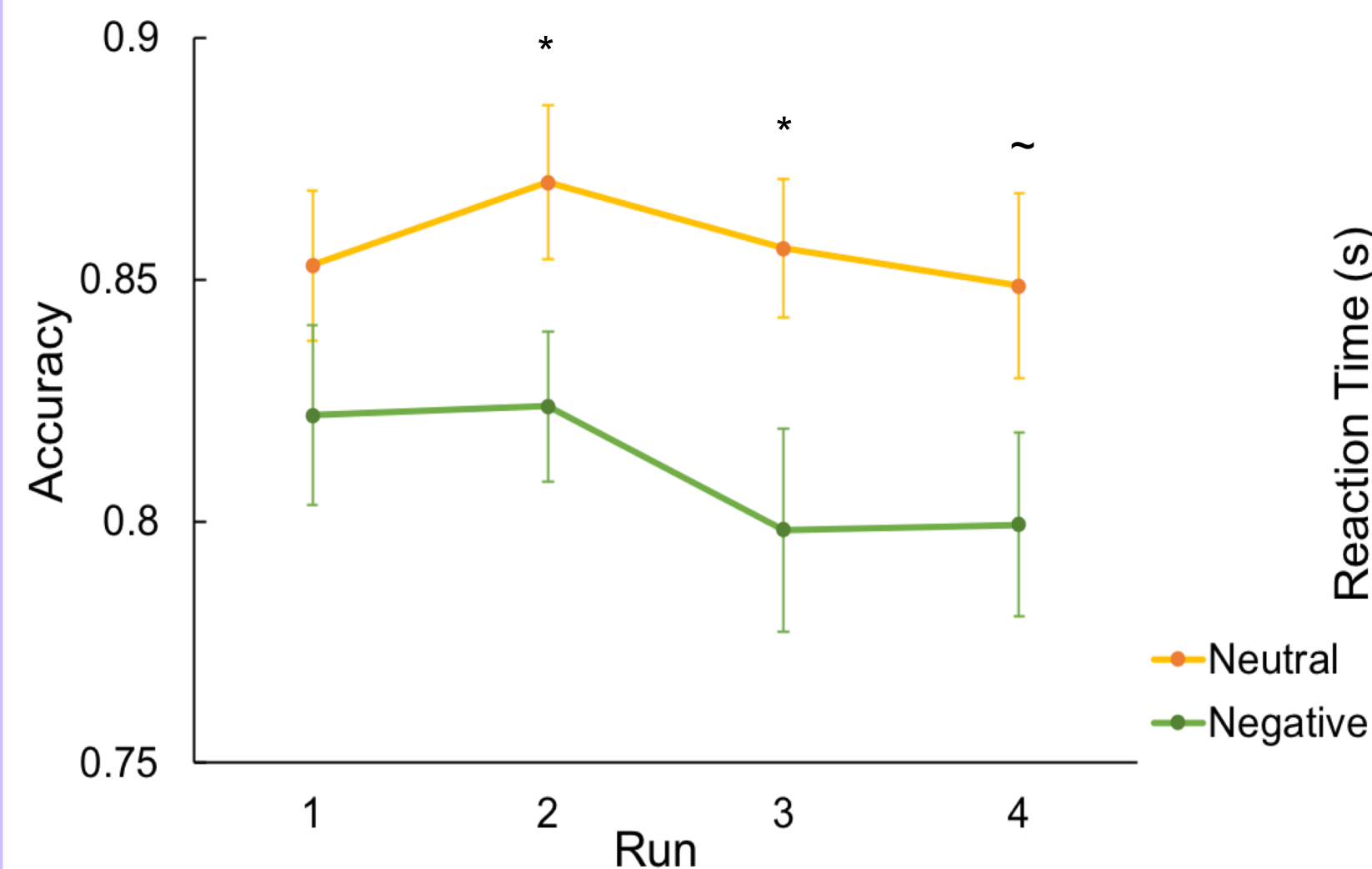
- Showed subjects a distractor image followed by paired objects
- 30 paired objects to study per run (120 pairs of objects to study in total)

Associative Memory Test:

- 30 trials per test run (120 test trials in total)
 - Measured Variables:
 - Accuracy – Proportion correct of each test run
 - Reaction Time – Median reaction time of correct trials of each test run
- Measure of memory strength

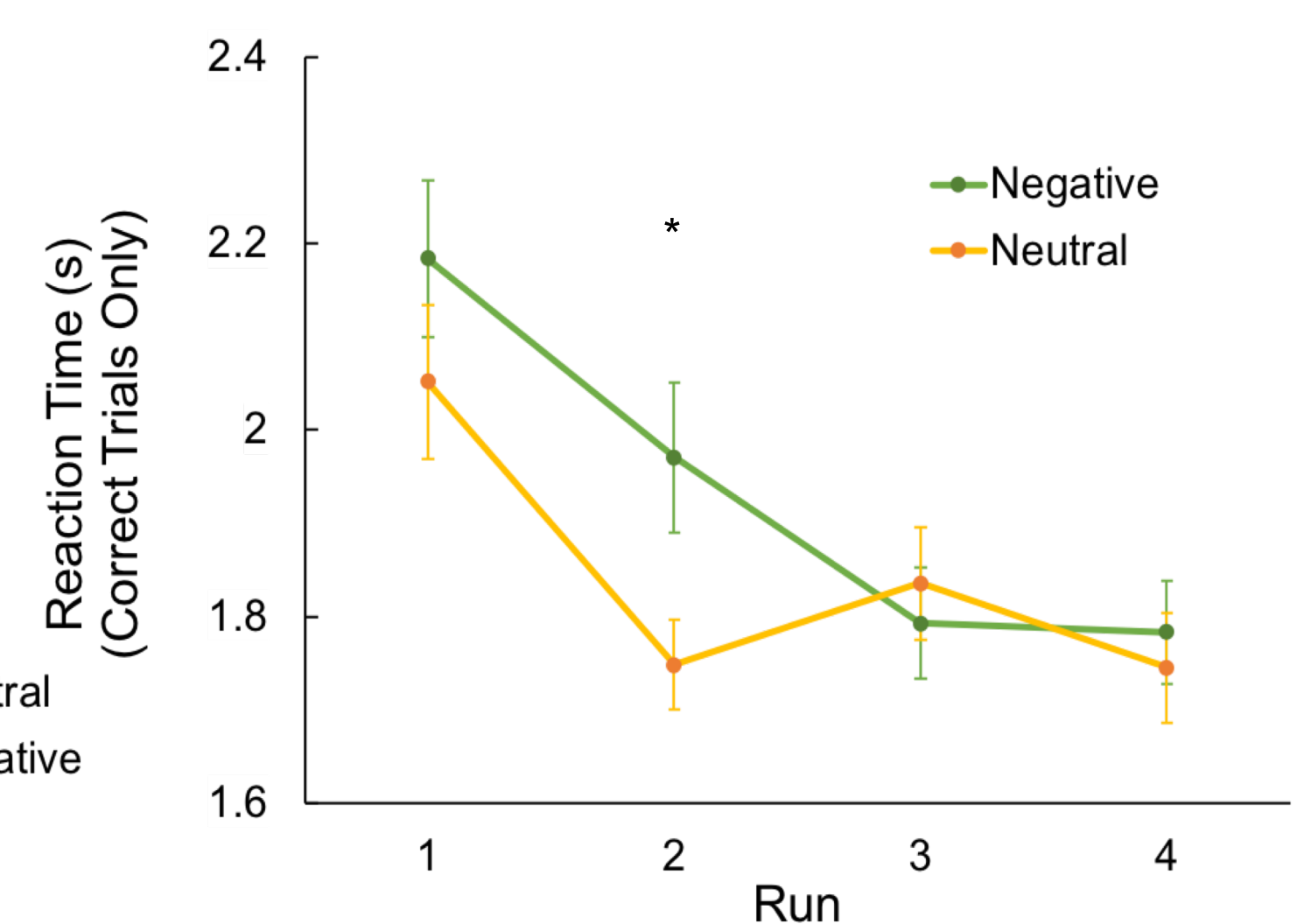
Results

Change in accuracy across runs



Subjects in the negative condition had significantly worse memory accuracy throughout the experiment compared to those in the neutral condition.

Change in reaction time across runs



Subjects in the negative condition were initially numerically slower in making their responses.

However, the difference in reaction time between conditions diminished over time.

Conclusions

Evidence for our research question was mixed:

- We did not find desensitization in terms of accuracy: negative emotion impaired associative memory throughout the experiment.
- Some evidence of desensitization was present in reaction time: negative emotion no longer slowed responses by the end of the experiment, suggesting more similar processing.

References

1. Bisby & Burgess (2014) *Learning and Memory*;
2. Bisby & Burgess (2017) *Current Opinion in Behavioral Sciences*;
3. Okada et al. (2011) *PLoS One*

Acknowledgements

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